SAFETY RISK ASSESSMENT FOR UAV OPERATION

Safety Hazard Identification, Safety Risk Assessment, Safety Risk Mitigation Safety Risk Documentation

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Content

Executive Summary

The drone flight safety is the desired optimum state in which drone operations executed in certain circumstances can be controlled with an acceptable operational risk.

By performing a safety risk assessment, commercial industry could help in advance to identify drone operation safety hazards.

The UAS safety risk assessment, based on a systematic approach from safety hazard identification to risk management, ensures the maintenance of the required safety standards for drone operations.

Drone Industry Insights presents a four-phase model of a UAS safety risk assessment. This approach is an appropriate solution, which fits according to the effort and usability, in everybody's organization.

This model, which should be used for drone flight permission and insurance applications, is the fundamental frame for a safe and reliable organization set up.

Not only the results but also the whole UAS safety risk assessment process should be documented to ensure a continuous safety assurance.

The Federal Aviation Authority (FAA) requires a preflight assessment including risk mitigation actions so that small unmanned aircraft will pose no undue hazard to other aircraft, people, or property in the event of a loss of control or other safety hazards (as per FAA NPRM RIN 2120–AJ60).

Risk assessment definition

The UAS safety risk assessment is an instrument used to identify and assess active and latent safety hazards for drone operation. This safety risk assessment includes actions for mitigating the predicted probability and severity of the consequences or outcomes of each operational risk.

An UAS safety risk assessment makes safety risks measurable so that risks can be better controlled.

Phases of UAS safety risk assessment

We recommend to separate the UAS safety risk assessment into the following four phases.

Figure 1: UAV safety risk assessment phases

Part I – Safety Hazard Identification:

Occurrences such as near misses or latent conditions, which led or could have led to drone operational flight safety harm, will be identified.

Part II – Safety Risk Assessment:

All identified hazards will be assessed, according to the operational risk's severity and operational risk probability.

Part III – Safety Risk Mitigation:

According to the operational risk acceptance level, risk mitigation action will be defined.

Part IV – Safety Documentation:

Not only the results but also the whole UAS safety risk assessment process should be documented to ensure a continuous safety assurance.

Part I - Safety Hazard Identification

Definition of safety hazards

With the first phase of the UAS safety risk assessment, we shall collect and identify operational drone safety hazards separated into “active failures” and “latent conditions”, both of which occur or might occur during the flight operations.
Active failures are actions – including errors and violations – that have an immediate effect. Generally, they are viewed as unsafe acts. Active failures are generally associated with front-line personnel (pilots, air traffic controllers, engineers, and so on).
Latent conditions are those that exist in the UAV system well before a damaging outcome is experienced. Initially, these latent conditions are not perceived as harmful, but could become evident once the system defenses are breached People removed in time and space from the event generally create these conditions.

List of UAV safety hazards: (10 examples)

- High loss of altitude
- Loss of control
- Loss of transmission
- Collision with manned, unmanned aircraft or buildings, power lines
- Partial failure or loss of navigation systems
- Severe weather or climatic events
- Existence of corrosion
- Pilot unfamiliar with area
- Rotor failures
- Take-off and landing incidents as under-shooting or overrunning

Safety hazards identification methodologies

Reactive: This methodology involves analysis of past outcomes or events. Hazards are identified through investigation of safety occurrences. Incidents and accidents are clear indicators of system deficiencies; therefore, they can be used to determine the hazards that contributed either to the event or to the latent.
Proactive: This methodology involves an analysis of existing or real-time situations during drone operation
Predictive: This methodology involving data gathering is used to identify possible negative future outcomes or events during drone operation, analyzing system processes and the environment, to identify potential future hazards, and to initiate mitigating actions (e.g. FMEA).

Examples of safety hazard identification sources

Following methods can be used to identify safety hazards:

- Flight Operations Data Analysis (FODA)
- Flight Reports
- Maintenance Reports
- Safety (& Quality) Audits / Assessments
- Voluntary reporting of Incident/accidents/near misses
- Mandatory accident reporting to the competent authority
- Brainstorm acc. to Failure Mode Effects Analysis (FMEA)
- Surveys

The identified safety hazards must be run through a root-cause analysis to identify the safety hazards causes and their potential consequences. The potential outcome shall be assessed according to their risks in the next phase, the UAS safety risk assessment.

A safety risk assessment is the fundament of safe drone operation and an instrument for continuous improvement.

Part II – Safety Risk Assessment

The second phase, the UAS risk assessment, measures the projected probability and severity of the consequences of the identified safety hazards of drone operation. This phase presents the fundamentals of safety risk management.

What is a risk?

Generally, a hazard has the same condition, which will be transformed into a risk when an action is exposed. The risk is the only parameter that can influence the condition of the hazard. A risk is the futuristic impact of a hazard.

HAZARD → ACTION (Exposure) → RISK

possibility of causing harm

probability of harm occurring

Safety risk probability

The safety risk probability is defined as the likelihood or frequency that the consequence of safety hazard might occur.
All scenarios should be taken into consideration. The probability must be categorized into criteria such as numbers. These numbers should be assigned to each probability level. The following figure displays a common used five level probability table. It is possible to extend the safety risk probability to 6, 10, or 15 values.

Likelihood	Detail ("customized example")	Value
Frequently	Likely to occur many times or has occurred frequently ("five times during operation")	5
Occasional	Likely to occur sometimes or has occurred infrequently ("Every second operation")	4
Remote	Unlikely to occur, but possible or has occurred rarely ("I know it from some events")	3
Improbable	Very unlikely to occur or not known to have occurred ("it happened once and I heard about it from other operator")	2
Extremely improbable	Almost inconceivable that the event will occur ("never happend")	1

Figure 3: UAV safety risk probability

UAV safety risk severity

The safety risk severity is defined as the extent of harm that might reasonably occur as an outcome of the identified safety hazard. The severity assessment can be based on injuries (persons) and/or damages (Drones and buildings, power lines, or the cost dimension).

- The worst foreseeable situation should be taken into account.
- The severity must be categorized in quantifiable criteria such numbers.
- These numbers should be assigned to each probability level.

The following figure displays a typical five level severity table

Severity	Customized Detail	Value
Catastrophic	Death to people; Drone, equipment or buildings destroyed	E
Hazardous	Serious injury to persons; major equipment or buildings damage	D
Major	Injury to persons; Further operation not possible without major adjustments	C
Minor	Minor incident to persons; Minor effect on system performance	B
Negligible	No injury to persons; Minor consequences on system	A

Figure 4: UAV safety risk severity

Additionally, risk assessors often use the “probability of detection” as a third dimension of the risk assessment (comparing to risk severity and probability). This dimension is commonly required in the product development, and it involves natural or technical safety barriers.

UAV safety risk acceptance

The third step in the UAV safety risk assessment process is to determine the safety risks that require actions.
The safety risk acceptance indicates the combined results of the safety risk probability and safety risk severity assessments. The respective assessment combination is presented in the safety risk assessment matrix shown in the following figures.

Safety risk probability						
	5	5A	5B	5C	5D	5E
	4	4A	4B	4C	4D	4E
	3	3A	3B	3C	3D	3E
	2	2A	2B	2C	2D	2E
	1	1A	1B	1C	1D	1E
		A	B	C	D	E
		Safety risk severity				

Safety risk probability						
	5	5A	5B	5C	5D	5E
	4	4A	4B	4C	4D	4E
	3	3A	3B	3C	3D	3E
	2	2A	2B	2C	2D	2E
	1	1A	1B	1C	1D	1E
		A	B	C	D	E
		Safety risk severity				

Figure 5: Customized UAV safety risk assessment matrices

This UAS safety risk matrix can be customized according to the UAS Company’s business or safety policy.

The combination of risk probability and severity indicates following:

- The safety risk acceptance level
  1. Red is not acceptable
  2. Yellow is tolerable but requires risk mitigation
  3. Green is an acceptable level
- The UAS safety risk index (SRI) can be used as an Indicator for statistical data acquisition and for a “before/after comparison” to measure the efficiency of a UAV safety risk management.

The corrective and preventive actions should be recorded in a UAV safety risk map to enable the assignment of persons, which shall be responsible for actions, and due dates.

Then, the UAS safety risk matrix must be exported to a safety risk acceptance matrix to determine the required actions that will mitigate the unacceptable and tolerable safety risks to an acceptable status.

Part III - Safety Risk Mitigation

The UAV safety risk mitigation explains the approach to react to unacceptable or tolerable UAV safety risks. It is a systematic reduction of the risk severity and the probability of its occurrence.

Acceptance level	Assessed UAS safety risk index (SRI)	Recommended actions
Unacceptable	3D, 4D, 5D, 1E, 2E, 3E, 4E, 5E	Immediate mitigation action and escalation is required; An operation stop should be considered
Tolerable	4A, 5A, 3B 4B, 5B, 1C, 2C, 3C, 4C, 5C, 1D, 2D	The safety risk shall be mitigated as low as reasonable practicable and should be approved
Acceptable	3D, 4D, 5D, 1E, 2E, 3E, 4E, 5E	No actions required

Figure 6: UAV safety risk acceptance matrix

The UAV safety risk acceptance matrix provides information about the required actions for the strategies of risk mitigation:

- Unacceptable - the probability and/or severity of the consequence is intolerable. Major mitigation or redesign of the system is necessary to reduce the probability or the severity of the consequences of the safety hazard to an acceptable level.

- Tolerable level - the consequence and/or likelihood is of concern; measures to mitigate the risk to a reasonably low level should be sought for. This risk can be tolerated if the risk is understood and if it has an endorsement within the organization.
- Acceptable level - the consequence is very unlikely or not severe enough to be of concern. The risk is tolerable and the safety objective has been met. However, consideration should be given to reduce the risk further to a reasonably practical level.

UAV safety risk mitigation actions can be separated into two dimensions:

- Corrective actions - Actions with an immediate effect for the safety hazard
- Preventive actions - Actions that have a long-term effect on the safety hazard to mitigate the risk to an acceptable level.

DRONEII.COM **UAS operational safety risk map**

	Safety hazard identification					Safety risk assessment				Safety risk mitigation			
ID	Safety item or hazard	Element	Root cause	Worst consequence	Type of finding	Severity	Probability	RPN	Risk level	Corrective action (CA)	Preventive action (PA)	Responsible	Due date for PA
1	Lack of power	Technical	Baterry	Harm to people	Minor	Catastrophical	Remote	3B	Tolerable	Change battery	Review power system	Tom	13. Dez. 15
2	Under-shooting or overruning during take-off	Pilot/People	GPS	Harm to people	Major	Major	Occasional	5D	Unacceptable	Keep people way from take-off area	System calibration	Tom	19. Dez. 15
3	Camera failure	Technical	Transmitter	No stream	Negligible	Major	Remote	3A	Acceptable	-	Train pilot to stay in connection	Jane	-

Figure 7: UAV safety risk map

The UAV safety risk mitigation describes the last step of a UAV safety risk assessment. The question, if a continuous review of UAS safety risks and a safety performance increase is necessary, is obsolete. UAV safety risk documentation and documented risk management procedures are required and are described in the following paragraphs.

Part IV: Safety Documentation

Not only UAV risk mitigation exercises need to be documented, but also the ambition of continuous improvement and a transparent organization need a documented risk management process.
Additionally a safety risk database – which shall be used as an evidence for required pre-flight checks or as a basis for UAS operation manuals – should be established.
Recommendations:

- Set up an UAS safety risk database including safety hazards and mitigation actions
- Establish a risk monitoring procedure
- Establish voluntary and mandatory reporting systems
- Establish a safety culture

A risk management process example is displayed in the following figure:

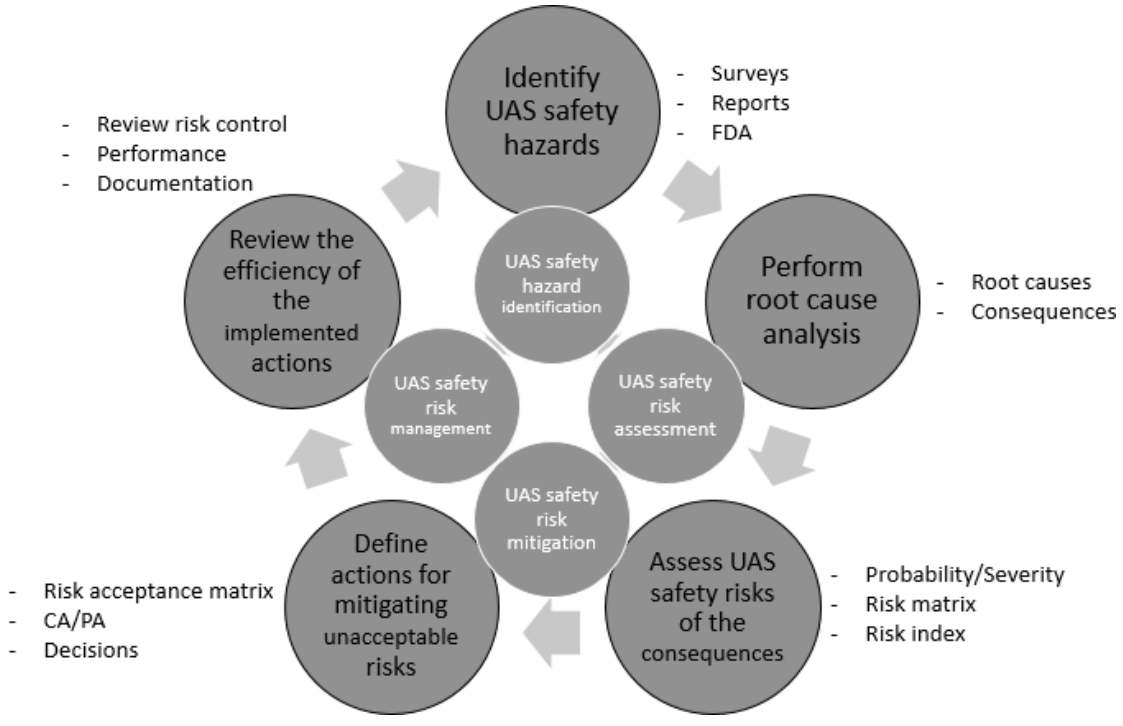

Figure 8 UAV safety risk management process

Flight Battery

WARNING

To avoid component malfunction, serious injury, and property damage, observe the following rules:

1. Only use official DJI flight batteries.

2. The voltage on the aircraft can reach 58.8 V. Read the battery's safety guidelines and take necessary precautions when handling the batteries to ensure your own safety.

3. DO NOT splash the battery with an excessive volume of water.

Compass

CAUTION

To avoid component malfunction, serious injury, and property damage, observe the following rule:

1. Land immediately when obvious drifting occurs in flight such as if the aircraft does not fly in a straight line.

NOTICE

Calibrate the compass when the app prompts you to do so. Observe the following rules when calibrating your compass:

1. It is important to calibrate the compass. The calibration result will affect the flight safety. The aircraft may malfunction if the compass is not calibrated.

2. DO NOT calibrate your compass where there is a chance of strong magnetic interference. This includes areas where there are utility poles or walls with steel reinforcements.

3. DO NOT carry ferromagnetic materials with you during calibration such as keys or mobile phones.

4. If the aircraft status indicators show a blinking red light, compass calibration has failed.

Please recalibrate.

5. After calibrating successfully, the compass may be abnormal when you place the aircraft on the ground. This may be because of underground magnetic interference. Move the aircraft to another location and try again.

Propulsion System

WARNING

To avoid serious injury to yourself or others, which may be caused by the rotating propellers and motors, observe the following rules:

Propellers

1. Check if the propellers are in good condition before each flight. Replace aged, chipped, or broken propellers.

2. Power off the aircraft before touching the propellers.

3. Be aware of the sharp edges of the propellers when mounting or removing the propellers.

4. Make sure that propellers are unfolded and firmly tightened before each flight.

5. Stay away from the rotating propellers and motors to avoid injuries.

Motors

1. Make sure that the motors are securely mounted and rotating smoothly.

2. DO NOT attempt to modify the structure of the motors.

3. DO NOT touch or let your hands or body come in contact with the motors after flight as they may be hot.

CAUTION

To avoid component malfunction, serious injury, and property damage, observe the following rules:

1. DO NOT block any of the ventilation holes on the motors.

NOTICE

1. Keep the motors free of dust.

2. If a motor is stuck and unable to rotate freely, execute the CSC to stop the motors immediately.

3. Make sure the sound of the motors when powering on is normal.

Spraying System

WARNING

To avoid component malfunction, serious injury, and property damage, observe the following rules:

Pesticide Usage

1. Avoid the use of powder pesticides as much as possible as they may reduce the service life of the spraying system.

2. Pesticides are poisonous and pose serious risks to safety. Only use them in strict accordance with their specifications.

3. Residue on the equipment caused by splashes or spills when pouring and mixing the pesticide can irritate your skin. Make sure to clean the equipment after mixing.

4. Use clean water to mix the pesticide and filter the mixed liquid before pouring into the spray tank to avoid blocking the strainer. Clear any blockage before using the equipment.

5. Make sure to stay in an upwind area when spraying pesticide to avoid bodily harm.

6. Wear protective clothing to prevent direct body contact with the pesticide. Rinse your hands and skin after handling pesticides. Clean the aircraft and remote controller after applying the pesticide.

7. Effective use of pesticides depends on pesticide density, spray rate, spray distance, aircraft speed, wind speed, wind direction, temperature, and humidity. Consider all factors when using pesticides, but DO NOT compromise the safety of people, animals, or the environment in doing so.

8. DO NOT contaminate rivers and sources of drinking water.

Sprinklers

1. Avoid using insoluble pesticides such as wettable powder.

2. The sprinklers are delicate parts. Clean them immediately after use.

3. DO NOT bend the hose in an arc tighter than its minimum bend radius. This is to avoid creasing, which may compromise the spraying effect.

4. Make sure to securely tighten the hose nuts to avoid liquid leakage.

Spray Tank

1. Make sure that the spray tank is firmly in place to avoid liquid leakage.

2. The spray tank load must not exceed the specified max value. Refer to the specifications of each aircraft model for more information.

Spherical Radar System

WARNING

To avoid component malfunction, serious injury, and property damage, observe the following rules:

1. DO NOT touch or let your hands or body come in contact with the metal parts of the radar module when powering on or immediately after flight as they may be hot.

2. Maintain full control of the aircraft at all times and do not rely on the radar module and DJI Agras app. Keep the aircraft within VLOS at all times. Use your discretion to operate the aircraft manually to avoid obstacles.

3. As shown in the figure below, the omnidirectional digital radar has a horizontal obstacle detection range of 360° and a vertical obstacle detection range of ±15° while the detection distance range is 1.5 to 30 m. Note that the aircraft cannot sense obstacles that are not within the detection range. Fly with caution. For the four gray areas in the figure, the detection performance of the radar module may be reduced due to the obstruction of the frame arms and landing gear. Fly with caution. The effective detection distance varies depending on the size and material of the obstacle. When sensing objects such as buildings that have a radar cross section (RCS) of more than -5 dBsm, the effective detection distance is 20 to 30 m. When sensing objects such as power lines that have a RCS of -10 dBsm, the effective detection distance is approximately 15 m. When sensing objects such as dry tree branches that have a RCS of -15 dBsm, the effective detection distance is approximately 10 m. Obstacle sensing may malfunction or be invalid in areas outside of the effective detection distance.

4. When mounting the omnidirectional digital radar, make sure the arrow mark is pointing

towards the aircraft front.

NOTICE

1. Comply with local radio transmission laws and regulations.

2. The sensitivity of the radar module may be reduced when operating several aircraft within a short distance. Operate with caution.

3. The obstacle avoidance functions are disabled in Attitude mode.

4. DO NOT attempt to disassemble any part of the radar module that has already been mounted prior to shipping.

5. The radar module is a precision instrument. DO NOT squeeze, tap, or hit the radar module.

Omnidirectional Digital Radar

1. Before use, make sure that the radar module is clean and the outer protective cover is not cracked, chipped, sunken, or misshapen.

2. Obstacle avoidance is adversely affected due to the obstruction of the aircraft body when aircraft pitch exceeds 15°. Slow down and fly with caution.

3. The radar module enables the aircraft to maintain a fixed distance from vegetation only within its working range. Observe the aircraft’s distance from vegetation at all times.

4. When sensing objects that have a vertical inclination of more than 5° such as an inclined line or inclined utility pole, the sensitivity of the radar module may be reduced. Fly with caution.

5. Operate with extra caution when flying over inclined surfaces. Recommended maximum inclination at different aircraft speeds: 10° at 1 m/s, 6° at 3 m/s, and 3° at 5 m/s.

6. Land the aircraft on flat ground to avoid damage to the radar module from raised objects.

Upward Radar

1. DO NOT block the position on the aircraft shell where the upward radar is located underneath. Otherwise, upward obstacle avoidance may be affected.

2. Make sure the position on the aircraft shell where the upward radar is located underneath is not cracked, chipped, or misshapen. Otherwise, upward obstacle avoidance may be

affected.

Firmware

WARNING

To avoid component malfunction, serious injury, and property damage, observe the following rule:

1. Keep people and animals at a safe distance during any firmware update, system calibration, and parameter setting procedures.

NOTICE

1. For safety, always update to the latest firmware version.

2. Only use official DJI firmware.

3. Make sure to update the remote controller’s firmware to the latest version after you update the aircraft’s firmware.

4. The remote controller may become unlinked from the aircraft after updating. Re-link the remote controller and aircraft.

5. Make sure to check all connections and remove the propellers from the motors before performing the firmware update.

DJI Agras App

NOTICE

1. Make sure to fully charge the remote controller batteries before launching the DJI Agras App.

2. Read all safety tips, warning messages, and disclaimers carefully. Be familiar with the related regulations in your area. You are solely responsible for being aware of all relevant regulations and flying in a way that is compliant. Make sure to pay close attention in the following situations: a. Using the auto-take off and auto-landing features. b. Setting the altitude beyond the default limit.

3. Land your aircraft immediately if a prompt appears in the app.

4. Examine and check all warning messages on the aircraft status list displayed in the app prior to each flight.

5. Cache the map data of the area where you intend to fly the aircraft by connecting to the internet before each flight.

4G Dongle

NOTICE

1. A dongle and SIM card are required for some product features in the DJI Agras app and users will bear the cost of these extras.

2. Be sure to use a DJI approved dongle.

3. DJI accepts no liability for accidents caused by the loss of user data or aircraft malfunctions originating from third party dongles and SIM cards.

4. Only use SIM cards that are compatible with the dongle.

5. Make sure you mount the dongle and the SIM card correctly. Otherwise, related functions will not be available.

Maintenance

WARNING

To avoid component malfunction, serious injury, and property damage, observe the following rules:

1. Clean all parts of the aircraft at the end of each day of spraying after the aircraft returns to a normal temperature. DO NOT clean the aircraft immediately after operations are completed. a. Fill the spray tank with clean water or soapy water and spray the water through the nozzles until the tank is empty. Repeat the step two more times. b. Detach the spray tank and spray tank connector to clean them (for T10 only). Remove the spray tank strainer, nozzle strainers, and nozzles to clean them and clear any blockage. Afterwards, immerse them in clean water for 12 hours. c. Make sure that the aircraft structure is completely connected so that it can be washed directly with water. It is recommended to use a spray washer filled with water to clean the aircraft body and wipe with a soft brush or wet cloth before removing water residue with a dry cloth. d. If there is dust or pesticide liquid on the motors, propellers, or heat sinks, wipe them with a wet cloth before cleaning the remaining water residue with a dry cloth. e. Store the cleaned aircraft in a dry environment.
2. Wipe the surface and screen of the remote controller with a clean wet cloth that has been wrung out with water daily after operations.
3. Inspect the aircraft every 100 flights or after flying for over 20 hours: a. Check for and replace worn propellers. b. Check for loose propellers. Replace propellers and propeller washers if needed. c. Check for aging plastic or rubber parts. d. Check for poor atomization

of the nozzles. Clean nozzles thoroughly or replace them. e. Replace nozzle strainers and the spray tank strainer.
4. DO NOT attempt to repair the aircraft. Contact DJI Support or a DJI authorized dealer if any parts are damaged.

NOTICE

1. Keep the protective cover of the radar module clean. Clean the surface with a soft damp cloth and air dry before using again.
2. Keep the FPV camera clean. First remove any larger pieces of grit or sand then wipe the lens with a clean, soft cloth to remove dust or other dirt.
3. In the event of a crash or collision, make sure to thoroughly inspect every part of the aircraft and make any necessary repairs and replacements before your next flight. If you have any problems or questions, contact DJI Support or a DJI authorized dealer.

Flight Condition Requirements

Weather Conditions and Surrounding Environment

WARNING

The aircraft is designed to operate in good to moderate weather conditions. To avoid collision, serious injury, property damage or imposing health hazards, observe the following rules:
1. DO NOT use the aircraft in adverse weather conditions such as winds exceeding 28 kph (17 mph), heavy rain (precipitation rate exceeding 25 mm (0.98 in) in 12 hours), snow, or fog.
2. To prevent health hazards to nearby people and to ensure effective spray, operate the aircraft to spray in wind speeds below 18 kph (11 mph).
3. Keep the aircraft at least 10 m (30 ft) away from obstacles, people, animals, buildings, public infrastructure, and bodies of water when in flight. As the aircraft's altitude increases, keep an even further distance away from the aforementioned objects or obstacles.
4. DO NOT fly over 4.5 km (14,763 ft) above sea level.
5. The DJI Agras app will intelligently recommend the payload weight of the tank according to the current status and surroundings of the aircraft. When adding material to the tank, the max weight should not exceed the recommended value. Otherwise, the flight safety may be affected.
6. DO NOT operate any part of the aircraft indoors.

NOTICE

1. Aircraft and battery performance is subject to environmental factors such as air density and temperature. a. Be careful when flying 2 km (6,560 ft) or more above sea level as battery and aircraft performance may be reduced.

2. DO NOT use the aircraft near accidents, fire, explosions, floods, tsunamis, avalanches, landslides, earthquakes, dust, or sandstorms.
3. In low temperature environments (between 32° and 50° F (0° and 10° C)), make sure that the flight battery is fully charged and be sure to reduce the payload of the aircraft. Otherwise, it will affect the flight safety or a takeoff limit will occur.

Interference with Flight Controller and Communications

NOTICE

1. Fly in open areas. Tall buildings, steel structures, mountains, rocks, or forests may affect the accuracy of the on-board compass and block both GNSS and remote control signals.
2. Avoid using wireless devices that use the same frequency bands as the remote controller.
3. When using with multiple aircraft, including T30, T10 and other aircraft, make sure that the distance between each aircraft is more than 10 m to avoid interference.
4. The sensitivity of the radar module may be reduced when operating several aircraft within a short distance. Operate with caution.
5. To avoid interference between operations, do not operate more than three groups within a 50 m radius when using the Multi-Aircraft Control function.
6. Be alert when flying near areas with magnetic or radio interference. These include, but are not limited to, high voltage lines, large scale power transmission stations or mobile base stations, and broadcasting towers. Failing to do so may compromise the transmission quality of this product or cause transmission errors which may affect flight orientation and location accuracy. The aircraft may behave abnormally or go out of control in areas with too much interference.
7. If the RTK dongle is used for field planning, the module should be disconnected from the remote controller after planning is completed. Otherwise, it will affect the communication performance of the remote controller.

Operating the Aircraft Responsibly

WARNING

To avoid component malfunction, serious injury, and property damage, observe the following rules:

1. Make sure you are not under the influence of alcohol, drugs, or anesthesia, or suffering from dizziness, fatigue, nausea, or any other conditions, whether physical or mental, that could impair your ability to operate the aircraft safely.
2. DO NOT stop the motors mid-flight unless in an emergency situation where doing so will reduce the risk of damage or injury.
3. Upon landing, power off the aircraft, and then power off the remote controller.
4. DO NOT drop, launch, fire, or otherwise project any dangerous payloads on or at any buildings, persons, or animals, or which could cause personal injury or property damage.

NOTICE

1. Make sure you have been sufficiently trained and have contingency plans for emergency situations or for when accidents occur.
2. Make sure you have a flight plan and DO NOT fly the aircraft recklessly.
3. DO NOT use this product for any illegal or inappropriate purpose such as spying, military operations, or unauthorized investigations.
4. DO NOT use this product to defame, abuse, harass, stalk, threaten, or otherwise violate the legal rights of others, such as the right of privacy and publicity.
5. DO NOT trespass onto private property of others.